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## BRITISH FISH PARASITES.

*The British Parasitic Copepoda.* By Dr. Thomas Scott and Andrew Scott. Vol. i. Pp. x+256. Vol. ii. Pp. xii+72 plates. (London: The Ray Society; Dulau and Co., Ltd., 1913.) Price 15*s.* net.

DR. THOMAS SCOTT has long been recognised as a leading authority on the smaller crustacea of the British seas, and his son, Mr. Andrew Scott, has also made important contributions to our knowledge of the same subject. It is fortunate, therefore, that the Ray Society has found these experienced investigators ready to undertake the preparation of a monograph on the British parasitic Copepoda, of which these two volumes, dealing with the species parasitic on fishes, form the first instalment.

The parasitic Copepoda have hitherto been somewhat neglected from a systematic and faunistic point of view. The student wishing to identify British specimens of fish-lice has had little to help him beyond Baird's "British Entomostraca," published by the Ray Society so long ago as 1850. The inadequacy of this help is shown by the fact that only thirty-four species of fish-parasites are described in Baird's volume, while the authors of the present monograph are able to record no fewer than one hundred and thirteen. The practical importance of a knowledge of the parasites of fishes in connection with fishery research hardly needs to be pointed out, and the careful descriptions and abundant illustrations now provided will prove a most useful foundation for future work in this department.

The authors have not attempted to deal seriously with the morphology and classification of the animals that they describe. For this course they can plead plenty of precedents, and it will meet with little condemnation from those zoologists of the younger generation who are so ready to proclaim the vanity of morphological research. It is likely, however, to cause the student some trouble when he finds, for instance, the term "fifth pair of thoracic feet" applied, in one family, to the appendages of the pre-genital somite, and transferred in the next family, without explanation or discussion, to those of the genital somite.

There are a number of minor blemishes throughout the work that might have been removed by more careful editing; specific names appearing for the first time are sometimes followed by the indication "sp. nov.," as on p. 202, sometimes not, as on p. 135; there is a lack of uniformity in the way in which references are made to the list of literature at the end of vol. i., and some of the references are obviously wrong; and the generic name *Phyllothyreus* appears on p. 92 and elsewhere as *Phyllothreus.* The colouring of some of the plates is very diagrammatic, and adds neither to their beauty nor their usefulness.

From a faunistic point of view, however, the work is of the highest importance, and it is to be hoped that it will attract other students to the many complex problems presented by the life-histories and bionomics of these strangely-modified parasites.

## DISEASE AND ITS PREVENTION.

(1) *Prevention and Control of Disease.* By Prof. F. Ramaley and Dr. C. E. Giffin. Pp. 386. (Boulder, Colo.: The University, 1913.)

(2) *Practical Bacteriology, Microbiology and Serum Therapy* (*Medical and Veterinary*). A Text-book for Laboratory Use. By Dr. A. Besson. Translated and adapted from the fifth French edition by Prof. H. J. Hutchens, D.S.O. Pp. xxx+892. (London: Longmans, Green and Co., 1913.) Price 36*s.* net.

(3) *A Monograph on Johne's Disease* (*Enteritis Chronica Pseudotuberculosa Bovis*). By F. W. Twort and G. L. Y. Ingram. Pp. xi+179+ix plates. (London: Baillière, Tindall and Cox, 1913.) Price 6*s.* net.

(1) THE authors of this book have undertaken the task of describing, in language intelligible to the educated man without special medical training, the present state of knowledge and opinion respecting the origin, nature, and methods of preventing important diseases. In the earlier chapters the principles of bacteriology and the meaning of terms employed in describing the phenomena of immunity are detailed and explained. In later chapters most of the common diseases are passed in review and the duty of an intelligent citizen in the presence of any such disease succinctly stated.

The vastness of the field attempted to be covered and the necessity of avoiding technical discussion in a work of this kind must needs result in portions of it appearing incomplete to a specialist reader. Thus the student of hereditary influences might doubt whether the authors sufficiently recognise the importance of the soil in the genesis of disease, while the statistician will feel that the face value of various sets of figures quoted differs from their intrinsic worth. Such criticisms as these, however, could be directed against any similar book, and we have no doubt that the present work will satisfactorily achieve the aim its authors had in view. Some suggestions for the improvement of future editions may not be out of place.

Vital statistics necessarily form the principal medium through which the layman acquires a knowledge of the prevalence of disease. The remarks on pp. 8-9 might be amplified with advantage. In particular the methods by which corrections for the age and sex constitutions of different populations are made can be readily explained to an intelligent reader, and such an explanation would enable him to avoid many fallacies in comparing mortality rates.

(2) This translation of Besson's well-known treatise forms a notable addition to the list of text-books on bacteriology available to the English student and laboratory worker, and we may say at the outset that Prof. Hutchens has admirably performed the undoubtedly difficult task of translating and emendating a foreign text-book in such a manner as to render it palatable to the English reader. The translator, while adhering closely to the French text, has wisely decided to reproduce the sense rather than the letter of the original, with the result that the text betrays little or no sign of its foreign origin. The present translation has been made from the last French edition, which appeared in 1911, and consequently numerous additions have been made by the translator so as to bring the matter up to date. The most extensive of these additions are the chapters embodying recent work on the relationships of the Gaertner-Paratyphoid group of bacilli, to which subject English writers have made important contributions, also on the work of the English Royal Commission on Tuberculosis, in which Prof. Hutchens formerly participated. The chapter on the microscope has also been entirely rewritten and contains a most complete account of the working of the modern microscope, including the principle of dark-ground illumination and its practical applications.

Besides these major additions to the French original, there is scarcely a page of the text which does not bear evidence of the work of the emendator. This generally takes the form of bracketed paragraphs or footnotes, which the translator has interpolated where the views of the French author, or the French school generally, happen to conflict with current English or German opinion. By the advanced laboratory worker these interpolations will be readily appreciated, but it is possible that the student may become bewildered by the multiplicity of these interpolations, which not infrequently contain opinions at variance with those of the French author. Short of rewriting the whole book, however, such defects are, of course, inevitable, and it is to be hoped that the translator, with the experience he has now gained, may see his way to compile an equally comprehensive and purely English text-book, in which greater scope for the exercise of criticism would be available than is possible in a work written at second hand. It is doubtful whether the French original was really the best foundation on which to build an English text-book. The English mind is essentially practical, and there is no doubt that many of the methods so minutely described by the French author and many of the complicated media recommended for the isolation of various micro-organisms are either antiquated, superfluous, or unworthy of mention. The arrangement of the matter in the book may justly be considered a model, and the prominent headings of the various sections are most helpful to the reader.

The book is well bound and beautifully printed, and the illustrations are excellent. The only important misprint we have noticed is the curious but consistent employment of "an" before such words as "homogeneous," "herd," and "horse."

As a most comprehensive treatise on bacteriology, we can confidently assert that Dr. Besson's book in its English dress has unique claims on English workers in bacteriology.

(3) The great merit of this monograph rests on the important contributions which the authors have made during the past four years to our knowledge of the etiology of Johne's disease.

This disease is one which affects cattle (and possibly also sheep and goats) in various countries, and it is only recently that serious attention has been directed to it in Great Britain. The chief pathological lesion in affected cattle is an irregular thickening of the bowel, generally in the neighbourhood of the ileo-cæcal valve, and the symptoms to which this lesion gives rise are chiefly diarrhœa and extreme emaciation. The disease leads to serious economic loss, and the name by which it goes in this country is that of Prof. Johne, of Dresden, who in 1895, in conjunction with Dr. Frothingham, first directed attention to the presence of acid-fast bacilli in the thickened intestine. For many years all attempts to cultivate these acid-fast organisms on artificial media either failed entirely or the cultures that were obtained from the lesions proved to be incapable of reproducing the disease in experimental animals. In 1910 Dr. Twort and Mr. Ingram started an investigation of this question and ultimately succeeded in obtaining a growth of the organism on an egg-medium in which killed tubercle bacilli were incorporated. Later it was found that the addition of killed Timothy grass bacilli, or glycerine extracts of these bacilli, gave equally good results.

These experiments have been repeated and confirmed by other workers.

Further, attempts to reproduce the disease by inoculation of artificial cultures have been successful. The authors have also carried out a considerable number of experiments with the view of obtaining a preparation of Johne's bacillus suitable for diagnostic purposes on the same lines as those on which the tuberculin test is at present applied. The results have been distinctly encouraging, and we may express the hope that lack of funds may not impede the further effective prosecution of the author's researches. The book has been very carefully written throughout, and concludes with a valuable bibliography. To all scientific veterinarians and stockbreeders this monograph may be heartily recommended.

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## MATHEMATICAL TEXT-BOOKS.

(1) *Elementary Algebra.* By C. Godfrey and A. W. Siddons. Vol. ii. Pp. xi + 227–530 + xlvi. (Cambridge University Press, 1913.) Price 2*s.* 6*d.*

(2) *Four-Figure Tables.* By C. Godfrey and A. W. Siddons. Pp. 40. (Cambridge University Press, 1913.) Price 9*d.* net.

(3) *Papers Set in the Mathematical Tripos, Part I., in the University of Cambridge,* 1908–1912. Pp. 70. (Cambridge University Press, 1913.) Price 2*s.* 6*d.* net.

(4) *Elementary Experimental Dynamics for Schools.* By C. E. Ashford. Pp. viii + 246. (Cambridge University Press, 1913.) Price 4*s.*

(5) *Mathematics, Science, and Drawing for the Preliminary Technical Course.* By L. J. Castle. Pp. vii + 149. (London: George Routledge and Sons, Ltd., 1913.) Price 1*s.* net.

(6) *Nomography, or the Graphic Representation of Formulae.* By Captain R. K. Hezlet. Pp. iv + 54. (Woolwich: Royal Artillery Institution, 1913.) Price 2*s.* 6*d.*

(7) *The Principles of Projective Geometry Applied to the Straight Line and Conic.* By J. L. S. Hatton. Pp. x + 366. (Cambridge University Press, 1913.) Price 10*s.* 6*d.*

(1) THE second volume of this treatise, which is intended to include as much as the pupil of average ability will assimilate in a full school course, opens with a treatment of indices and logarithms. The next two chapters deal with variation of functions of one or more variables. This is followed by harder equations, surds, proportion, and progressions. The next four chapters contain an excellent introduction to the differential and integral calculus. Although confining themselves to very simple functions, $x^2$, $x^3$, $1/x$, the authors have illustrated all the important ideas of the subject. The educational value of such work as this is very great, and we have little doubt that in a few years' time it will be accepted as a regular part of the non-specialist course. This and the chapter on progressions are the outstanding features of a book which is admirable throughout. An appendix is added containing such parts of the subject as are still required by various conservative examining bodies, but which the authors hope further reform will soon render unnecessary. There is an excellent set of test papers.

(2) We welcome the issue of this set of four-figure tables chiefly on account of their low price. Now that their use has become so general it is important that students should be able to procure them in an inexpensive form. There is little to note in regard to their contents, which include, in addition to squares, square-roots, reciprocals and logarithms, the usual trigonometrical tables. In our opinion it is unfortunate that the table of logarithms is not placed at the beginning. Coming as it does at p. 22, some time will always be lost in finding it. The arrangement of the table of square-roots is new and distinctly ingenious; for instance, opposite to 42, printed one below the other are the numbers 2049, 6481, thus making it impossible for the pupil to take the square-root from the wrong page.

(3) This collection of papers, set under the new regulations for the first part of the mathematical tripos, besides being of use to undergraduates at Cambridge, is interesting as showing the change in character of the work required from candidates for honours since the abolition of the order of merit. The ten-minute conundrum has now practically disappeared, and its place taken by more practical and straightforward questions. With the exception of some electricity and optics, there is practically nothing that the capable specialist would not be able to do on leaving school, and the course, therefore, suits not only those who are intending to take up research work, but also those who will afterwards turn to mechanical science, engineering, or physics.

(4) The use of a trolley and inclined plane has done much to smooth away the difficulties from the path of those who attempt an experimental introduction to dynamics. Most teachers now agree that it is unsatisfactory to allow the ordinary student to confine himself to a theoretical treatment. Mr. Ashford quotes from Thomson and Tait's standard treatise a remark that "Nothing can be more fatal to progress than a too confident reliance on mathematical symbols, for the student is only too apt to consider the *formula*, and not the *fact*, as the physical reality." And he has set